

# Work Order ID 67272

Monday, March 14, 2011 2:16:23 PM



Page 1

Item ID: D412-664-203TRN

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Turning Detail

Start Date: 3/14/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 3/18/2011 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals: Process Plan: *M*

Date: *1-03-14*

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Stop



| Sequence ID/<br>Work Center ID | Operation<br>Description | Set Up/<br>Run Hours | Tool ID | Tool # | Plan<br>Code | Accept<br>Qty | Reject<br>Qty | Reject<br>Number | Insp.<br>Stamp |
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|

| Draw Nbr     | Revision Nbr |
|--------------|--------------|
| D412-664-243 | Rev E        |

100 0.00



MORI SEIKI CNC LATHE LARGE

Mori Seiki

Memo

0.00

Mori Seiki CNC Lathe Large

1-Fill tube with sand & install plugs DT8534 on both ends as per Folio FA166  
2-Turn first side as per Folio FA166  
3- File transition lines smooth.

*M.L./JFS 11/05/06*

*1* *Ø*

110 0.00



QC1- Inspect dimensions to dimension sheet

QC

Memo

0.00

Quality Control

*J.FS/ M.L 11/05/06*

*1* *Ø*

120 0.00



MORI SEIKI CNC LATHE LARGE

Mori Seiki

Memo

0.00

Mori Seiki CNC Lathe Large

1-Turn second side as per Folio FA166  
2- File transition lines smooth.  
3- Remove sand and plugs  
4-Scribe part # and batch # using vibrating stylus

*J.FS/ M.L 11/05/06*

*1* *Ø*

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Page 2

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Run Start



Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Stop



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

130

QC1- Inspect dimensions to dimension sheet

0.00



QC

Memo

0.00

Quality Control

M.L./J.F.S 11/05/06 1 0

140

QC8- Inspect parts - second check

0.00



QC

Memo

0.00

Quality Control

B A 11/05/06 1 0

150

Crosstubes Chemical Conversion

0.00



HandFXtube

Memo

0.00

Hand Finishing Crosstubes

SAD 11-05-06 1

**Work Order ID 67272**

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Page 3

Item ID: D412-664-203TRN

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Turning Detail

Start Date: 3/14/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 3/18/2011 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

160

QC3- Inspect Part Finish

0.00



QC

Memo

0.00

Quality Control

11-5-6

170

Packaging

0.00



Packaging

Memo

0.00

Packaging

Identify and stock in kanban rack  
Location: 46

11-5-6

180

QC21- Final Inspection - Work Order Release

0.00



QC

Memo

0.00

Quality Control

11/5/99

MF

11-05-06

# Picklist Print

Monday, March 14, 2011 2:16:29 PM

Page 1

Work Order ID: 67272



Parent Item: D412-664-203TRN



Parent Item Name: Crosstube Turning Detail


Start Date: 3/14/2011

Required Date: 3/18/2011

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:A 08-03-06 new issue DD verified by:ec  
IPP Rev B 08.04.02 Removed polish EC verified by: DD

| Component Item ID/<br>Item Name  | Replacement<br>Item ID | Mfg/<br>Purch | Bin<br>Item | Primary<br>Location | Last<br>Location | Route<br>Seq ID | Unit of<br>Measure | Qty on<br>Hand | Qty per Kit | Total<br>Qty | Qty<br>Issued | Date<br>Issued | Status |
|--|------------------------|---------------|-------------|---------------------|------------------|-----------------|--------------------|----------------|-------------|--------------|---------------|----------------|--------|
| D6009-129<br> |                        | Manufactured  | No          |                     |                  | 120             | Each               | 6.0000         | 1           | 1            |               |                |        |

Crosstube Material

Location

LG

38342

53594

65179

Loc Qty

6

2

4

Loc Code

1 ML/J.F.S 11/05/06

|   |                                  |
|---|----------------------------------|
| <b>DART AEROSPACE LTD</b>                             | <b>Work Order:</b> 67277         |
| <b>Description:</b> Crosstube Assembly (412 High Aft) | <b>Part Number:</b> D412-664-243 |
| <b>Inspection Dwg:</b> D412-664-243 <b>Rev:</b> E     | <b>Page 1 of 1</b>               |

### FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

| Inspection Sheet | Drawing Dimension | Tolerance     | Actual Dimension | Accept | Reject | Method of Inspection | Comments |
|------------------|-------------------|---------------|------------------|--------|--------|----------------------|----------|
| SIDE A           | 2.684             | +0.005/-0.000 | 2.687            | ✓      |        | Mic                  | CNC-04   |
|                  | 2.748             | +0.005/-0.000 | 2.750            | ✓      |        | "                    |          |
|                  | 2.884             | +0.005/-0.000 | 2.886            | ✓      |        | "                    |          |
|                  | 3.019             | +0.005/-0.000 | 3.019            | ✓      |        | Mic                  | CNC-05   |
|                  | 3.163             | +0.005/-0.000 | 3.165            | ✓      |        | "                    |          |
|                  | 3.308             | +0.005/-0.000 | 3.315            | ✓      |        | Mic                  | CNC-05   |
|                  | 3.429             | +0.005/-0.000 | 3.433            | ✓      |        | Mic                  | CNC-05   |
|                  | 2.990             | +0.005/-0.000 | 2.994            | ✓      |        | "                    |          |
|                  | 2.618             | +0.005/-0.000 | 2.622            | ✓      |        | Mic                  | CNC-04   |
|                  | 0.200             | +/-0.010      | 0.204            | ✓      |        | vern ml-7            |          |
|                  | R0.063            | +/-0.010      | R0.063           | ✓      |        | R.G.                 | Ref.     |
|                  | R0.500            | +/-0.010      | R0.500           | ✓      |        | R.G.                 | Ref.     |
|                  | 4.971             | +/-0.030      | 4.977            | ✓      |        | vern.                | J.F-01   |
|                  |                   |               |                  |        |        |                      |          |
| SIDE B           | 2.684             | +0.005/-0.000 | 2.685"           | ✓      |        | Mic                  | CNC-04   |
|                  | 2.748             | +0.005/-0.000 | 2.749"           | ✓      |        | "                    |          |
|                  | 2.884             | +0.005/-0.000 | 2.886"           | ✓      |        | "                    |          |
|                  | 3.019             | +0.005/-0.000 | 3.022"           | ✓      |        | Mic                  | CNC-05   |
|                  | 3.163             | +0.005/-0.000 | 3.165"           | ✓      |        | "                    |          |
|                  | 3.308             | +0.005/-0.000 | 3.312            | ✓      |        | "                    |          |
|                  | 3.429             | +0.005/-0.000 | 3.432            | ✓      |        | "                    |          |
|                  | 2.990             | +0.005/-0.000 | 2.992"           | ✓      |        | "                    |          |
|                  | 2.618             | +0.005/-0.000 | 2.619"           | ✓      |        | Mic                  | CNC-05   |
|                  | 0.200             | +/-0.010      | 0.205            | ✓      |        | vern ml-7            |          |
|                  | R0.063            | +/-0.010      | R0.063           | ✓      |        | R.G.                 | Ref.     |
|                  | R0.500            | +/-0.010      | R0.500           | ✓      |        | R.G.                 | Ref.     |
|                  | 4.971             | +/-0.030      | 4.964            | ✓      |        | vern.                | J.F-01   |
|                  | 124.100           | +/-0.020      | 124.115          | ✓      |        | Tape                 | JF-03    |

|                            |                        |                            |     |
|----------------------------|------------------------|----------------------------|-----|
| <b>Measured by:</b> ML/JFS | <b>Audited by:</b> B.A | <b>Prototype Approval:</b> | N/A |
| <b>Date:</b> 11/05/06      | <b>Date:</b> 11/05/06  | <b>Date:</b>               | N/A |

| Rev | Date     | Change                                | Revised by | Approved |
|-----|----------|---------------------------------------|------------|----------|
| A   | 04.06.16 | New Issue (P/O D412-664-203)          | KJ/JLM     |          |
| B   | 06.03.09 | Dwg Rev updated                       | KJ/JLM     |          |
| C   | 07.05.08 | Tolerance updated for dimension 4.971 | KJ/JLM     |          |
| D   | 10.02.02 | Dimension 124.100 was 124.09          | KJ         |          |

| Item | Qty<br>-243 | Part Number    | Description   |
|------|-------------|----------------|---|
| 1    | X           | D412-664-243   | CROSSTUBE ASSEMBLY (412 HIGH AFT)   |
| 2    | 1           | D6009-129      | CROSSTUBE   |
| 3    | 2           | D3595-063-570  | RUBBER CUSHION  |
| 4    | 1           | D2896-1        | SUPPORT   |
| 5    | 2           | D3189-1        | CHAFING SHIELD  |
| 6    | 2           | D2856-600-1009 | ABRASION STRIP  |
| 7    | 4           | MS21920-28     | CLAMP   |
| 8    | 2           | MS21920-30     | CLAMP (OR MS21920-32)   |
| 9    | A/R         | MAGNOBOND 6398 | ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE<br>(TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2<br>ADHESIVE) |

#### GENERAL NOTES:

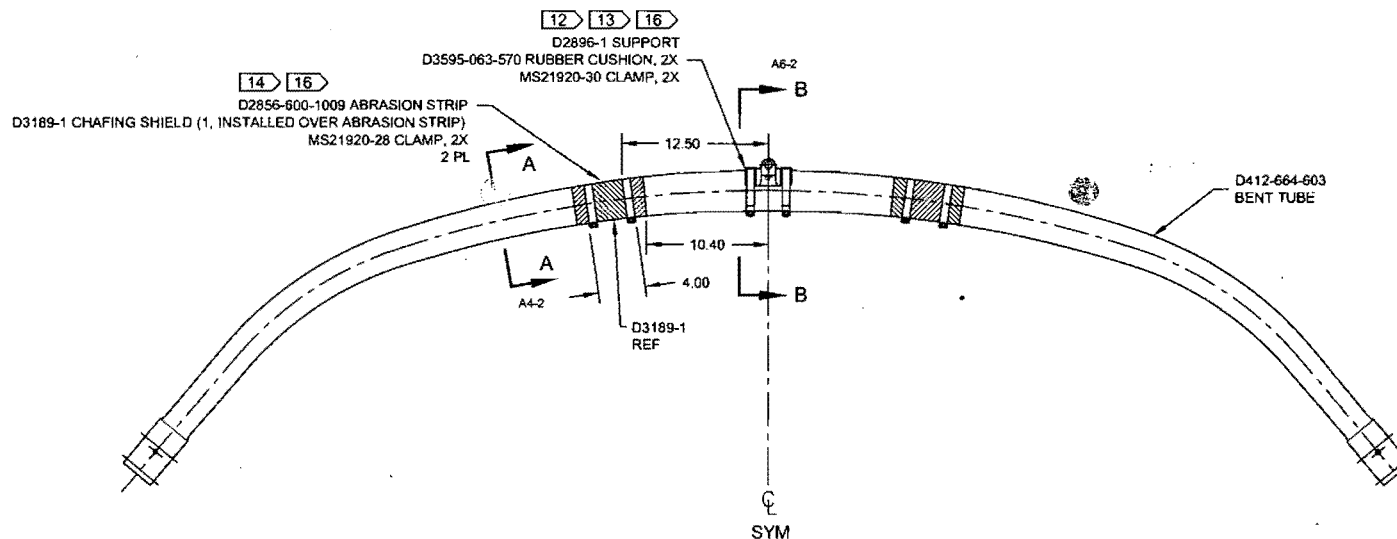
- 1) MATERIAL: MANUFACTURED FROM D6009-129  
FINISHED LENGTH = 124.100±0.020 (BEFORE BENDING/TRIMMING)
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D412-664-243" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 47.0 lbs (PER IIN-D212-664)
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2896-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2896-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-30 CLAMPS (OR -32) WITH D3595-063-570 RUBBER CUSHIONS TO SECURE THE D2896-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.
- 14) INSTALL D2856-600-1009 ABRASION STRIPS WITH A 0.13 REF GAP ON BOTTOM SIDE OF CROSSTUBE PER QSI 035.
- 15) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 16) TORQUE CLAMPS 80 TO 100 IN.-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

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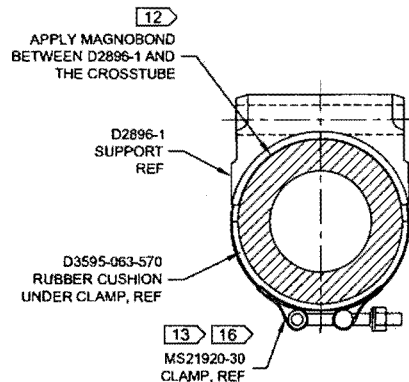
*pl 11-03-14*

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2009-10-29  
*WAP*

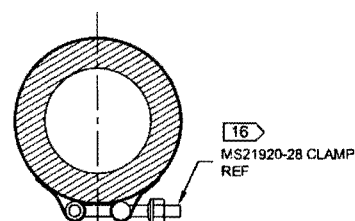
|            |  |  |          |
|------------|--|--|----------|
| E          | REFORMAT/REVISE GENERAL NOTES;<br>REORGANIZED VIEWS AND REFORMATTED DRAWING<br>TO CURRENT STANDARDS; RELOCATED FLAG #6 PER<br>PAR 08-046 (ZN A6-3); ADD TOLERANCE (ZN B6-3, C4-3,<br>C8-3 & C5-3); MOVED TURNING DETAIL & UPDATED<br>TOLERANCE TO SHEET 4. | RF   | 09.09.30 |
| D          | REMOVE D2732-058, CHANGE TO D3595-063-570  | PH   | 07.03.09 |
| C          | REMOVE D2856-600-1087, ADD D2732-058 &<br>MAGNOBOND 6398, MS21920-32 WAS MS21920-30  | MB   | 06.10.27 |
| B          | ADD HOLES FOR COMPATABILITY WITH BHT/AA<br>SKIDTUBES   | PH   | 05.02.04 |
| A          | NEW ISSUE  | PH   | 01.10.17 |
| REV.       | DESCRIPTION  | BY   | DATE     |
| DESIGN     | <i>PH</i>  | <b>DART AEROSPACE LTD</b><br>HAWKESBURY, ONTARIO, CANADA<br><br>DRAWING NO. <b>D412-664-243</b> REV. E<br>SHEET 1 OF 4<br>TITLE <b>CROSSTUBE ASSEMBLY (412 HI AFT)</b> SCALE <b>NTS</b><br><br><small>COPYRIGHT © 2001 BY DART AEROSPACE LTD<br/> THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS<br/> NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT<br/> WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small> |          |
| DRAWN      | RF   |  |          |
| CHECKED    | <i>PH</i>  |  |          |
| MFG. APPR. | <i>PH</i>  |  |          |
| APPROVED   | <i>PH</i>  |  |          |
| DE APPR.   | <i>PH</i>  |  |          |
| DATE       | 09.09.30   |  |          |



**D212-664-243**  
**ASSEMBLY DETAIL**



**SECTION B-B**  
SCALE 4X

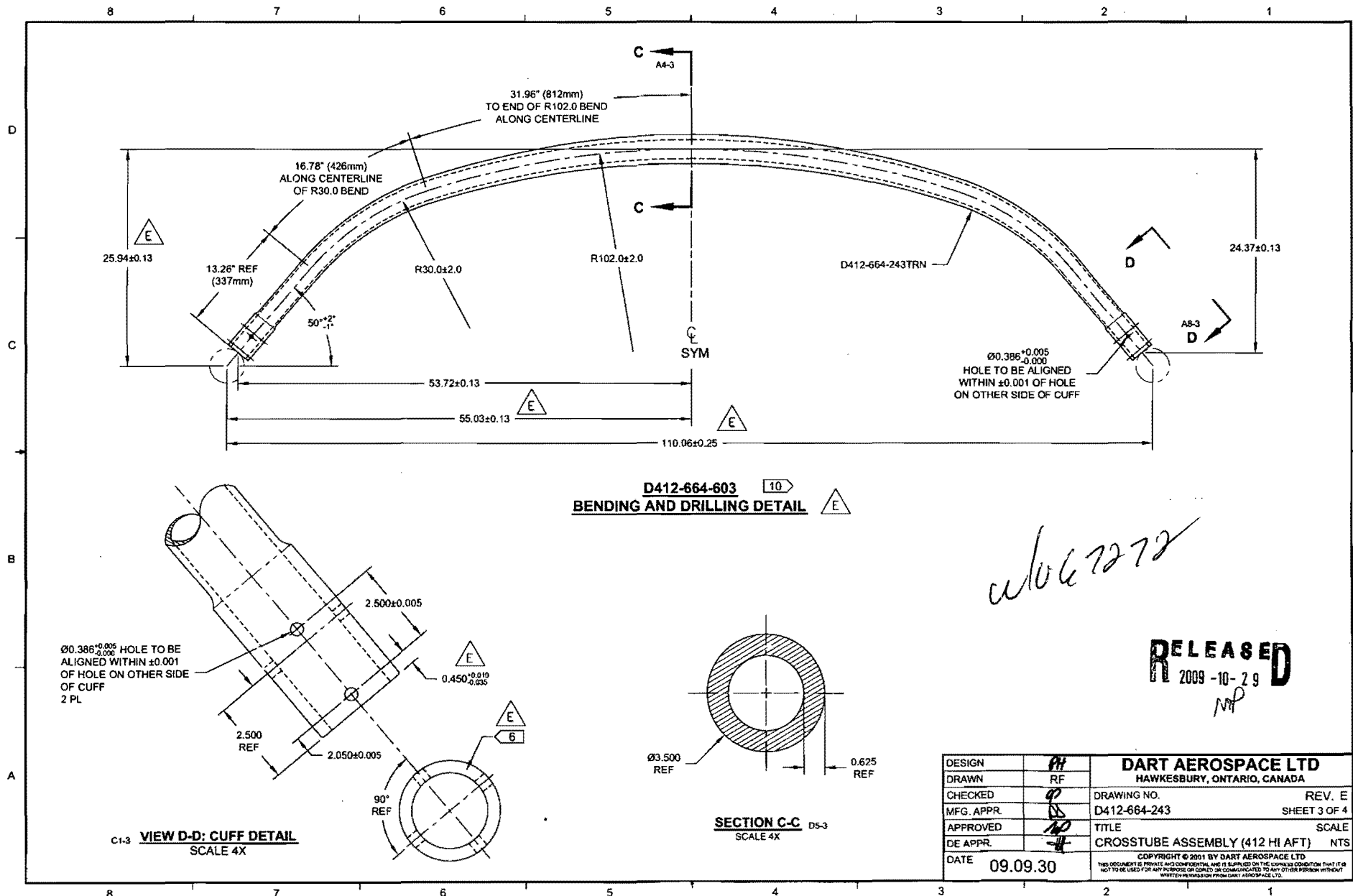


**SECTION A-A**  
SCALE 4X

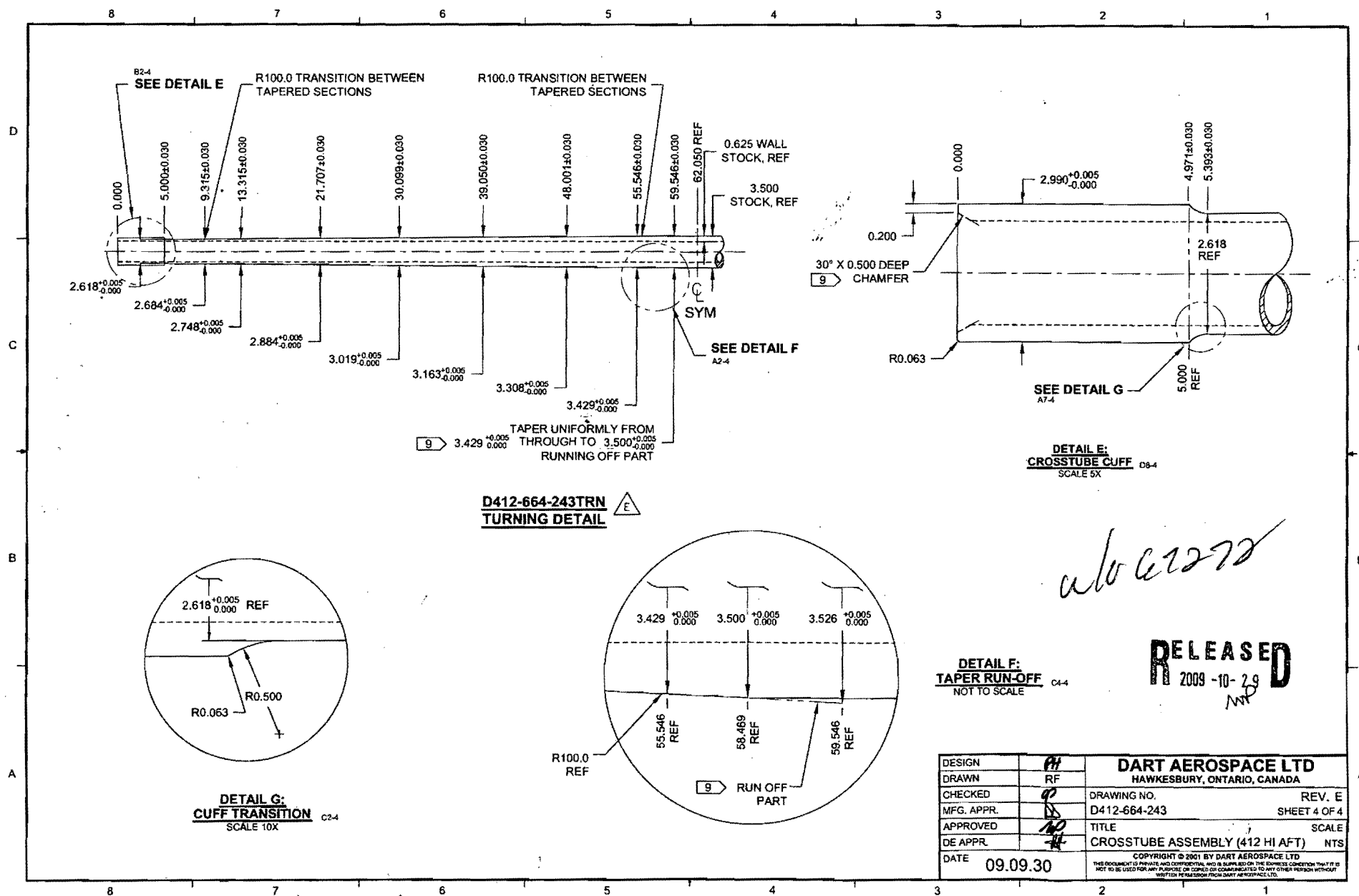
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2009-10-28  
*NRP*

|            |           |   |              |
|------------|-----------|---|--------------|
| DESIGN     | <i>PH</i> | <b>DART AEROSPACE LTD</b>   |              |
| DRAWN      | <i>RF</i> | <b>HAWKESBURY, ONTARIO, CANADA</b>  |              |
| CHECKED    | <i>Q</i>  | DRAWING NO.   | REV. E       |
| MFG. APPR. | <i>JS</i> | D412-664-243  | SHEET 2 OF 4 |
| APPROVED   | <i>JP</i> | TITLE   | SCALE        |
| DE APPR.   | <i>JP</i> | CROSSTUBE ASSEMBLY (412 HI AFT)   | NTS          |
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